

**Scholarly Dialogs**

**SD3 (1-4)**

## **Vaccine or not vaccine: that's the question.**

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### **Abstract**

In light of the most significant burden of COVID-19 in terms of severe disease and deaths, great progress have been made on the vaccination front with a significant reduction in the severe disease course, rate of hospitalization and deaths, especially in the older population, and also suffering from chronic diseases. Looking at the paediatric population, World Health Organization (WHO) and Food Drug Administration (FDA) are currently reviewing the scientific evidence on the need and timing of vaccinating the paediatric population with the currently available COVID-19 vaccines. Herein, we briefly summarized the impact of COVID-19 on the pediatric population and reported the most recent evidence on the efficacy and safety of COVID-19 vaccination in children.

**KeyWords: Keywords:** Children; COVID-19; efficacy; safety; vaccination.

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### **Introduction**

On November 12, 2022, 142.469.743 total COVID-19 vaccination administrations have been notified. Of these, 49.443.368 subjects received at least one dose, and 48.702.019 completed the vaccination cycle. Specifically, 42.517.216 individuals received a single booster, and 6.357.664 underwent the second booster. Looking at children 5-11 age, 1.408.515 received at least one dose, and 1.289.259 children completed the vaccination cycle [1]. The lower impact of COVID-19 vaccination in the paediatric population is due to the late introduction of vaccination in this cluster of population. Moreover, the COVID-19 vaccine hesitancy or acceptance for children among parents is frequently due to “myths and beliefs”, despite several studies being performed to decline this trend [2]. On the other hand, a national survey reported that healthcare workers, particularly physicians and dentists, are concerned about recommending the COVID-19 vaccination to their patients and relatives [3].

### **Factors influencing COVID-19 vaccination advise**

What factors influence the choice to advise for or against COVID-19 vaccination? Aiming to find an answer to this question, herein, we briefly summarized the impact of COVID-19 on the pediatric population and reported the most recent evidence on the efficacy and safety

of COVID-19 vaccination in children. SARS-CoV-2 typically causes less severe illness and fewer deaths in children and adolescents compared to adults [4]. However, although children are less likely to be symptomatic or develop severe symptoms, they can experience an inflammatory multisystem syndrome associated with SARS-CoV-2 (MIS-C), featured by persistent fever and evidence of single or multiorgan dysfunction, and laboratory evidence of inflammation (neutrophilia, lymphopenia, and hypoalbuminemia) [5]. Moreover, children can experience “Long-COVID”, also known as a post-COVID condition, when they experience symptoms that affect their physical, mental or social well-being for months after a COVID infection. The risk both of MIS-C and Long-COVID was found to be significantly lower in vaccinated compared with unvaccinated children and adolescents, probably explained by vaccine-induced modulation of the immune system that makes it less prone to hyperinflammation onset after SARS-CoV-2 infection [6, 7].

### **Efficacy of vaccination**

Concerning the efficacy vaccination, authors analyzed data on 255,936 children aged between 5 to 11 years of age to assess the incidences of all reported SARS-CoV-2 infections (confirmed on polymerase-chain-reaction [PCR] assay, rapid antigen testing, or both), SARS-CoV-2 infections confirmed on PCR assay, and COVID-19–related hospitalizations among unvaccinated, partially vaccinated ( $\geq 1$  day after the first dose of vaccine and up to 6 days after the second dose), and fully vaccinated children ( $\geq 7$  days after the second dose). Globally, among unvaccinated children, the incidence of all reported SARS-CoV-2 infections and COVID-19–related hospitalizations were 3777.8 and 30.0 per 1 million person-days, respectively. Among partially vaccinated children, vaccine effectiveness was 13.6% against all SARS-CoV-2 infections, 24.3% against PCR-confirmed SARS-CoV-2 infection, and 42.3% against COVID-19–related hospitalization. In fully vaccinated children, vaccine effectiveness was 36.8%, 65.3%, and 82.7%, respectively. Therefore, BNT162b2 vaccination reduced the risks of SARS-CoV-2 infection and COVID-19–related hospitalization, although it provided moderate protection when compared to documented SARS-CoV-2 and symptomatic COVID-19 [8]. Concerning the efficacy vaccination, authors analyzed data on 255,936 children (5-11 years of age) to assess the incidences of all SARS-CoV-2 infections (confirmed on rapid antigen testing, polymerase-chain-reaction (PCR) assay, or both), SARS-CoV-2 infections confirmed on PCR assay, and COVID-19–related hospitalizations among unvaccinated, partially vaccinated (major than 1 day after the first dose of vaccine and up to 6 days after the second dose), and fully vaccinated children (major than 7 days after the second dose). Globally, among unvaccinated children, the incidence of all reported SARS-CoV-2 infections and COVID-19–related hospitalizations were 3303.5, 473.8, and 30/1.000.000 person-

days, respectively. In partially vaccinated children, vaccine effectiveness was 13.6% against all SARS-CoV-2 infections, 24.3% against PCR-confirmed SARS-CoV-2 infection, and 42.3% against COVID-19-related hospitalization. In fully vaccinated children, vaccine effectiveness was 36.8%, 65.3%, and 82.7%, respectively. Therefore, BNT162b2 vaccination decreased the risk of SARS-CoV-2 infection and COVID-19-related hospitalization, although it provided moderate protection when compared to documented SARS-CoV-2 and symptomatic COVID-19 [9].

### **Safety of vaccination**

Safety findings for the Pfizer-BioNTech vaccine from 3 United States monitoring systems in children ages 5 to 11 did not report safety signals during active surveillance. Among 48,795 children, 7,578 adverse events were detected, and of these, 97% were mild-moderate (injection site pain, fatigue, headache, myalgia, chills, and fever), 194 were severe; 15 myocarditis were also verified, but their incidences were substantially lower than those observed among adolescents ages 12 to 15 years [10].

Globally, World Health Organization (WHO) concludes that COVID-19 vaccinations in children and adolescents are safe and effective in preventing disease; however, because the direct health benefit of vaccinating in the healthy paediatric population is lower compared with older adults, it is more urgent to vaccinate older people and those suffering chronic diseases and health workers [11]. On the other hand, Food Drug Administration (FDA) stated that vaccinations remain the most effective measure to prevent the severe consequences of COVID-19 and its long-term effects, although COVID-19 tends to be less severe in children. Accordingly, FDA strongly supports parents to consider vaccination an updated booster dose in their children when eligible [12].

### **Conclusion**

In conclusion, it appears how is urgently required scientific evidence on the advantage in taking COVID-19 vaccination especially in the younger population. Community leaders, members of the health public and healthcare workers have to make further efforts to support vaccination in health settings, dispel beliefs, overcome mistrust in government or medical professionals, and make “the right” information accessible.

**Conflicts of Interest.** The Authors declare no conflict of interest

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